

ON THE TYPES IN THE GENUS *PELOSCOLEX* LEIDY (OLIGOCHAETA: TUBIFICIDAE)

Ralph O. Brinkhurst

Abstract.—The selection of neotypes for *Peloscolex variegatus* is defended, but the subdivision of the genus is supported.

Four groups of species are emerging, but the final disposition of all former *Peloscolex* species cannot be ascertained as yet.

When the author first undertook to revise the Tubificidae it rapidly became apparent that few genera, if any, were based on properly defined type species. Several names had become fixed in the literature by common usage, and so a deliberate attempt was made to preserve those names so long as this action did not clearly violate established nomenclatural procedures. The genus *Peloscolex* was among the most difficult to deal with as, unlike most other genera in the family, it seemed to be characterized by the coating of papillae on the body wall which led authors to assume that many species were congeneric without detailed description of the male reproductive structures or even the setae where these were obscured by the papillae. The type species is *P. variegatus* Leidy, 1851, by reason of monotypy, but it has never been recorded since it was first discovered.

It would have been possible to regard Leidy's description as inadequate, and to have removed the genus name from availability, but this would almost certainly have been challenged by some subsequent author claiming to be able to recognise the type from the brief original account, which was limited to the following details:

- Setae usually 10 in each anterior dorsal bundle, sometimes 6. Ventral setae bifid.
- Prominent or elevated rounded tubercles in transverse circles.
- From a ferruginous spring, Philadelphia.

At an early stage in the investigation of North American Tubificidae the author came across some hitherto undescribed material which seemed reasonably consistent with the original account of *variegatus*, and selected a neotype (USNM 32626) and paraneotypes (USNM 32627, American Museum of Natural History 3662, British Museum Natural History 1964.15.8) as noted in Brinkhurst (1965). This designation was deficient in that it referred back to the redescription by Brinkhurst (1962) but did not mention that a search of the collections at Philadelphia proved the types had been

destroyed. This action preserved the name *Peloscolex*, although it has become generally acknowledged that the papillate body wall is no longer a good generic character and that some division of the genus is required. Holmquist (1978) has challenged the selection of the neotypes, which could certainly be shown to fail a stringent application of Article 75 of the International Code of Zoological Nomenclature, and claims to be able to recognize another American species, *P. multisetosus* (Smith, 1900), as conspecific with Leidy's original. The evidence for this will be examined point by point, and the implications of the decision will be discussed before some suggestions are made as to the necessary division of the species assemblage into genera.

The setae.—Leidy's specimen(s) had 6–10, usually 10 setae per bundle dorsally, bifid setae ventrally.

Brinkhurst's specimens had 2–4 hair setae and 2–4 short hair-like setae in dorsal bundles for a total of 4–8; the ventral setae are bifid apart from those of II–IV where at least one may be simple-pointed, though this is very difficult to see without specifically looking.

Holmquist reports (1978) that Brinkhurst's types have "only up to about 3 long hair setae and one or a few short pectinate setae in the dorsal bundles," and she suggests that Leidy "would hardly have seen more than double the number of long dorsal hair setae"

The description of *P. multisetosus* lists 3–14 hair setae and 1–5 lyre-shaped pectinate setae for a total of up to 19 setae per bundle, or about double the number Leidy saw!

As Leidy did not mention any differences between the dorsal setae, I have assumed the hairs and hair-like setae were not separated by him. As he could see the ventral bifids he most certainly would have seen the obvious pectinate setae in what was later described as *multisetosus*.

The papillae.—The early literature on *Peloscolex* talks about two types of papillae, body wall extensions through the foreign matter called sensory or secretory papillae, and the general papillae with their included foreign matter. Holmquist (1978) illustrates these well. The sensory papillae are hard to see in preserved worms, in which they may be expected to be affected by rough preservation methods often employed. Hrabe (1973) discussed these in *P. velutinus* (Grube), a species clearly close to *variegatus* sensu Brinkhurst as noted by Holmquist (1978) who suggests grouping these and other taxa in the genus *Embolocephalus* Randolph. In *velutinus* there are, according to Hrabe (op. cit.) one line of large secretory papillae on the anterior segments of the transverse line of the setal bundles, and posteriorly two lines with one between the setal lines. He goes on to state that the younger worms have secretory papillae of only one size, so I take it that mature forms have two sizes of these without considering the ordinary papillae (which are smaller than the large secretory ones). Kasprzak (1976)

published a photograph of the papillae of *P. velutinus* plus what he refers to as cutaneous glands. The papillae are in 2–3 regular transverse rows, and are prominent. If these specimens are conspecific with my *velutinus* material, their appearance is relevant to this argument. In my collection of few specimens of either *velutinus* or my *variegatus* I cannot see these elevated (enlarged) papillae on the whole mounts. It is my contention that the descriptions of papillae by Hrabe and Kasprzak are almost identical to that of Leidy, and that other similarities between *velutinus* and *variegatus* validate the comparison. The discovery by Holmquist of spermathecal setae in *variegatus* requires a close comparison of this with *velutinus* and *nikolskyi* Last. and Sok.

The papillae in *multisetosus* are of a very different dimension. They are so remarkable that Leidy may well have been moved to describe them in much stronger terms than prominent or elevated. Factually, both *multisetosus* and *variegatus mihi* have papillae which qualify, they differ in size and ease of visibility of the sensory/secretory papillae, but *variegatus* usually has a closer covering of the body wall papillae not specifically mentioned by Leidy.

Locality.—Holmquist does not discuss locality or habitat although these points were raised in correspondence with her. Philadelphia is within the geographical range of both *variegatus mihi* and *multisetosus* (J. Hiltunen, personal communication). The species overlap in the St. Lawrence Great Lakes but *multisetosus* seems to be a more southern species at its northern limits with the reverse for *variegatus*. Specimens resembling this species have been found in Washington State, most recently in Mowitch Lake, Mount Rainier Park, 1966 by G. Larson. These specimens are notable in that there are up to 5 (serrate) hair setae and 6 short hair-like setae with minutely pectinate tips, but there are usually only 3–4 of each. In segment II the dorsal bundle includes a less hair-like bifid seta with an elongate upper tooth. These also resemble *P. nikolskyi*, known from Asiatic Russia, and all of these may be conspecific.

Habitat.—A ferruginous spring suggests to me a close connection to ground water and adequate aeration. *P. multisetosus* is often found in warm, eutrophic habitats if not frankly polluted sites. *P. variegatus*, on the other hand, is a cold water oligotrophic species largely limited to big lakes. Similar ecological habits in species like *L. profundicola* and *R. falciformis* have led to their detection in large lakes and small spring-fed streams, so a spring as the type locality seems consistent with the known ecology of *variegatus mihi*. Mr. M. Loden (personal communication) collected *variegatus* in cold Pennsylvania streams in winter in sand-gravel substrates.

Taxonomic stability.—Several possible decisions could flow from the various positions adopted. Leidy's species could be declared to be unrecognizable by virtue of the impossibility of deciding between *multisetosus*

Smith and *variegatus mihi* on the basis of Leidy's description which was, to say the least, inadequate. If Leidy's species were to be dubbed a species inquirenda I assume the generic name would be unavailable if it were placed on the Official Index by the Commission. The whole lexicon of old generic names could then be reactivated including *Saenuris* Grube, *Embolocephalus* Randolph, *Spirosperma* Eisen, *Pachydermon* Claparede, *Hemitubifex* Beddard and *Tubificoides* Lastockin (see Brinkhurst and Jamieson 1971 for details). Indeed, this is exactly what Holmquist is obliged to do, although *Saenuris*, *Pachydermon*, *Peloryctes* and *Hemitubifex* for *Edukemius* are not available as can be deduced by inspection of the synonymies in Brinkhurst and Jamieson, 1971, pp. 453, 481, 506, 508–9, 572–74. As the genus is to be broken up, rejection of *Peloscolex* might seem to be the wisest course, if legal, but stability could be challenged at any time by a claimed recognition of Leidy's species.

By accepting the author's decision, the name *Peloscolex* remains available for the major group of species formerly in that assemblage.

Accepting *P. multisetosus* as a synonym of *variegatus* would cause maximum confusion in a literature now very extensively used by applied biologists using sludge-worms in pollution biology in North America. The grounds for doing this would have to be very substantial for it to gain acceptance by this community, which is continually disturbed by changes in generic names. Holmquist suggests that Smith (1900) suggested a possible synonymy of his *multisetosus* and *P. variegatus* of Leidy, but my interpretation of that suggestion is that Smith believed the two to be potentially congeneric though he described his species as an *Embolocephalus*. Beddard (1895) stated categorically that *variegatus* of Leidy had dorsal setae all hair-like, as in *velutinus*, but it is not clear that he saw types or communicated with Leidy. The latter was President of the Philadelphia Academy of Natural Sciences (where his collections were) until he died in 1891.

Discussion.—Holmquist has contributed two major changes to the description of *variegatus mihi*. She discovered genital setae of a form that I anticipated might be present when discussing the closely related *nikolskyi* Last. and Sok. (Brinkhurst and Jamieson 1971, p. 508), but I hardly expected my prophesy to be substantiated from my own neotypes. She also finds no cuticular penis sheaths which I believed to be present. As these are absent in the related *velutinus* and *nikolskyi* it would seem that I was looking at the normal cuticular layer of the penis sac, which becomes thicker in genuine penis sheaths.

Otherwise I suggest that my *variegatus* is no more at odds with Leidy's original than is *multisetosus*. My suggestion to Holmquist in a personal communication was that a sensible option might be to declare Leidy's description to be inadequate and to reject the name *Peloscolex*, especially as the genus is bound to be divided as a result of more recent work by a number of authors. If my *variegatus* is upheld, the name *Peloscolex* can be

used for the bulk of the limnic species (which Holmquist divides into *Embolocephalus*, *Spirosperma*, *Orientodrilus* and perhaps more—she does not yet attribute all the species she has seen into genera, nor does she mention at least six species in the recent literature). The name *Embolocephalus* Randolph is not available for *multisetosus* and its ally *moszynskii* as the type of the genus is *velutinus* Grube, so that a new name must be created. If Holmquist's decision is adopted, two well known North American species swap names (*variegatus* for *multisetosus*), *variegatus* gets a new name as yet unspecified, and the generic name *Peloscolex* becomes applied to a pair of species that are clearly separate from the genus as currently defined. I can only conclude that Holmquist has chosen the worst possible path from the point of view of stability of the nomenclature, and I would prefer to retain my designation of neotypes of *variegatus*.

The other decisions made by Holmquist are as yet incomplete, but it can be said that the two genera *Tubificoides* and *Edukemius* sensu Holmquist are part of a larger assemblage of marine species (including former *Tubifex* species and new entities) currently being assembled by Brinkhurst and Baker (1979) the type species of which should correctly be cited as *T. heterochaetus* Lastockin, 1937 (synonym = *T. swirencowi* Jaroschenko, 1948 = *Peloscolex swirencowi* Jar. Hrabe, 1964; non *Limnodrilus heterochaetus* Michaelsen, 1926 = *Peloscolex heterochaetus* [Mich.] de Vos 1936;—all vide Brinkhurst and Jamieson 1971, pp. 508, 511, 521 for references).

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